

The E951 Pulsed Solenoid Project

Cryogenic Safety Committee Review
August 20, 2002

Agenda

1. Project Overview H.G. Kirk
2. Cryogenic Systems G. Mulholland
2. ODH Issues J. Scaduto

The Grand Goal

Intense Muon Beams

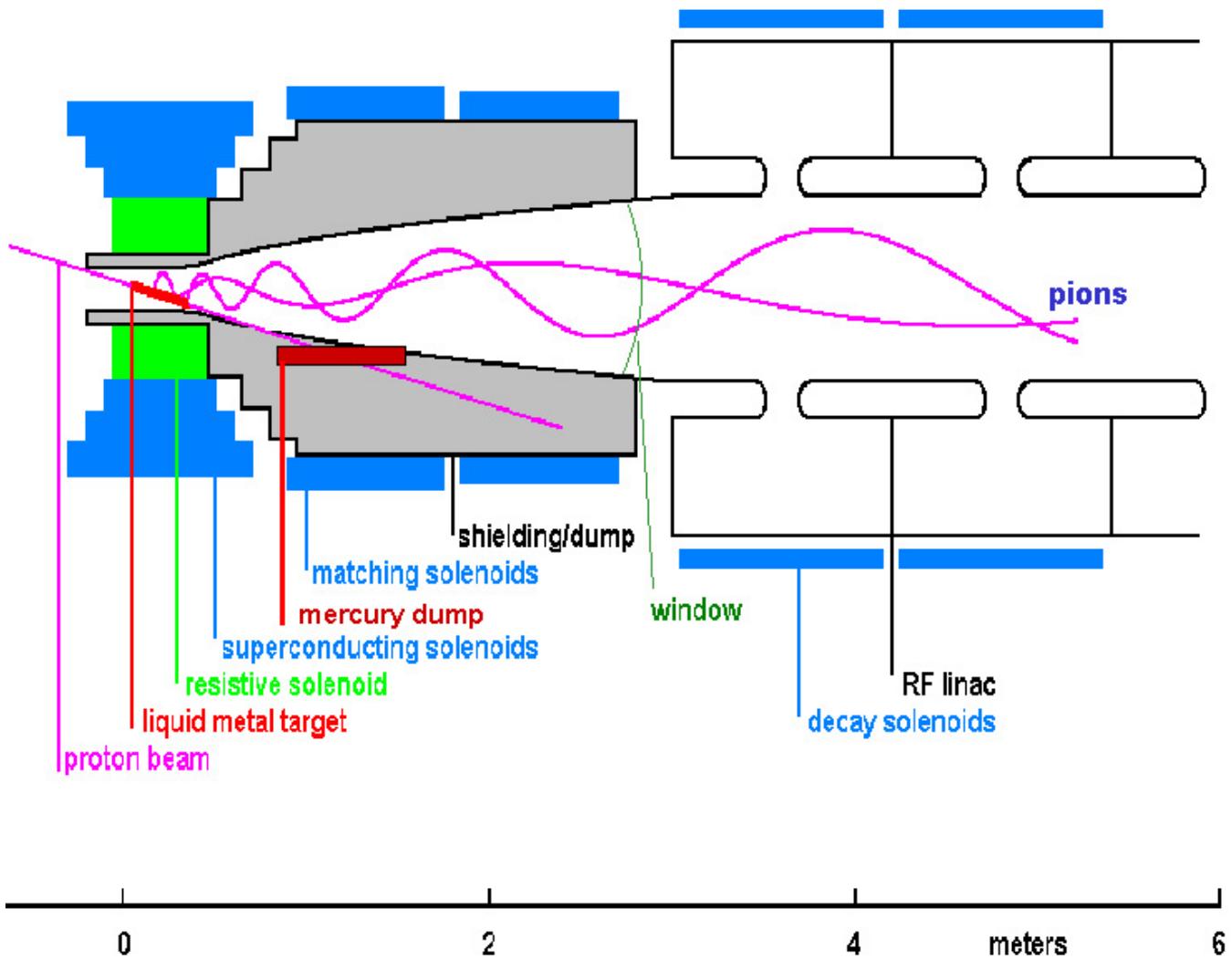
W. Marciano:

The 21st Century: Century of the Muon?
New York City, PAC'99

1. Muon Catalyzed Fusion
2. Discover new physics using heavy point-like particles.

- g-2 at the AGS
- MECO AGS proposal
- Muon Collider
- Neutrino Factory

Overview of Targetry for a Muon Collider

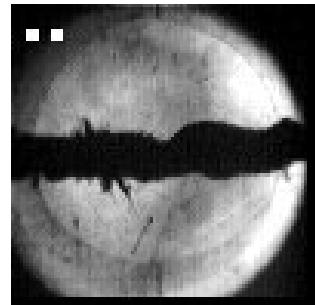
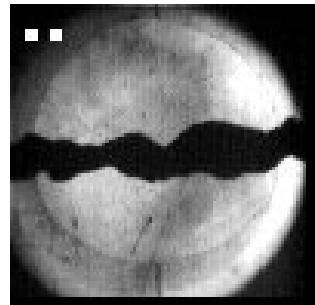


- $1.2 \times 10^{14} \mu^\pm/\text{s}$ via π -decay from a 4-MW proton beam.
- Proton pulse $\approx 1 \text{ ns rms}$ for a muon collider.
- Mercury jet target.
- 20-T capture solenoid followed by a 1.25-T π -decay channel with phase-rotation via rf (to compress energy of the muon bunch).

A3 Beamline End Station

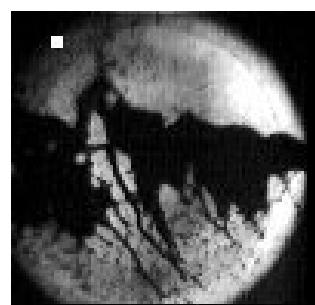
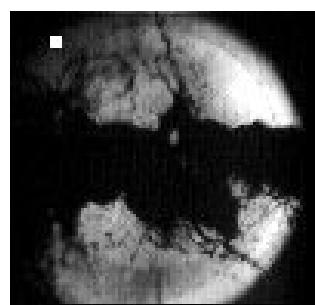


3.8×10^{12} 24 GeV Protons on Hg Jet



t=0 ms

t=0.75 ms

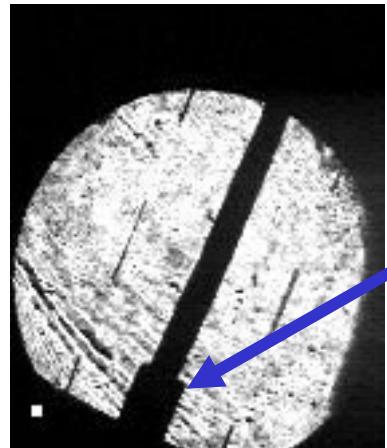
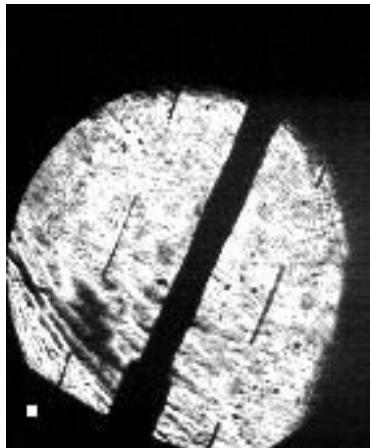
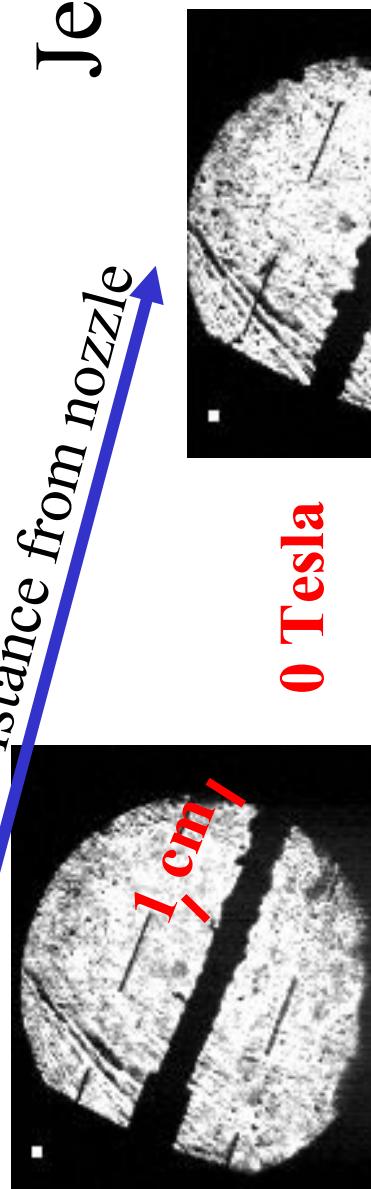


t=10 ms

t=18 ms

Jet traverses B_{\max}

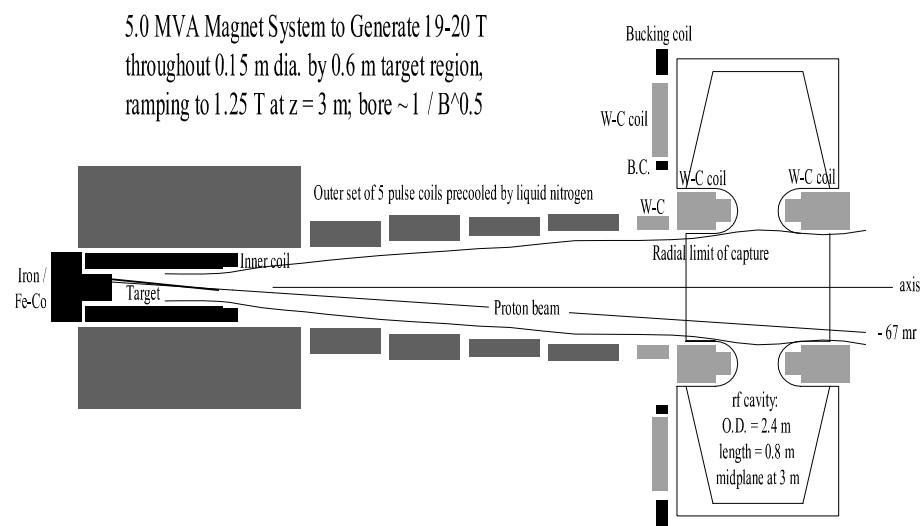
Distance from nozzle



This qualitative behaviour can be observed in all events.

E951

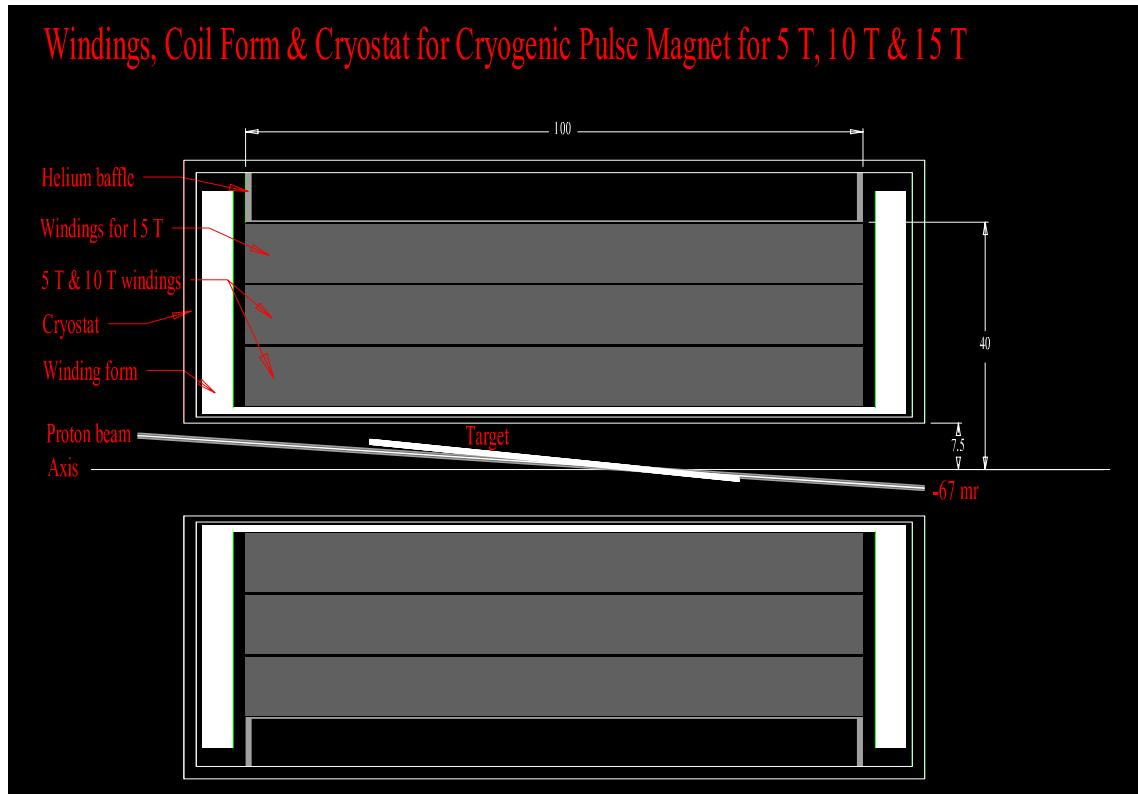
20T Pulsed Solenoid



1. 5 MVA Pulsed Power Supply
2. 15 Metric Tonnes Coil Package
3. 80° K operation
4. Switch power from outer to inner coil
5. Cost \$4.5M

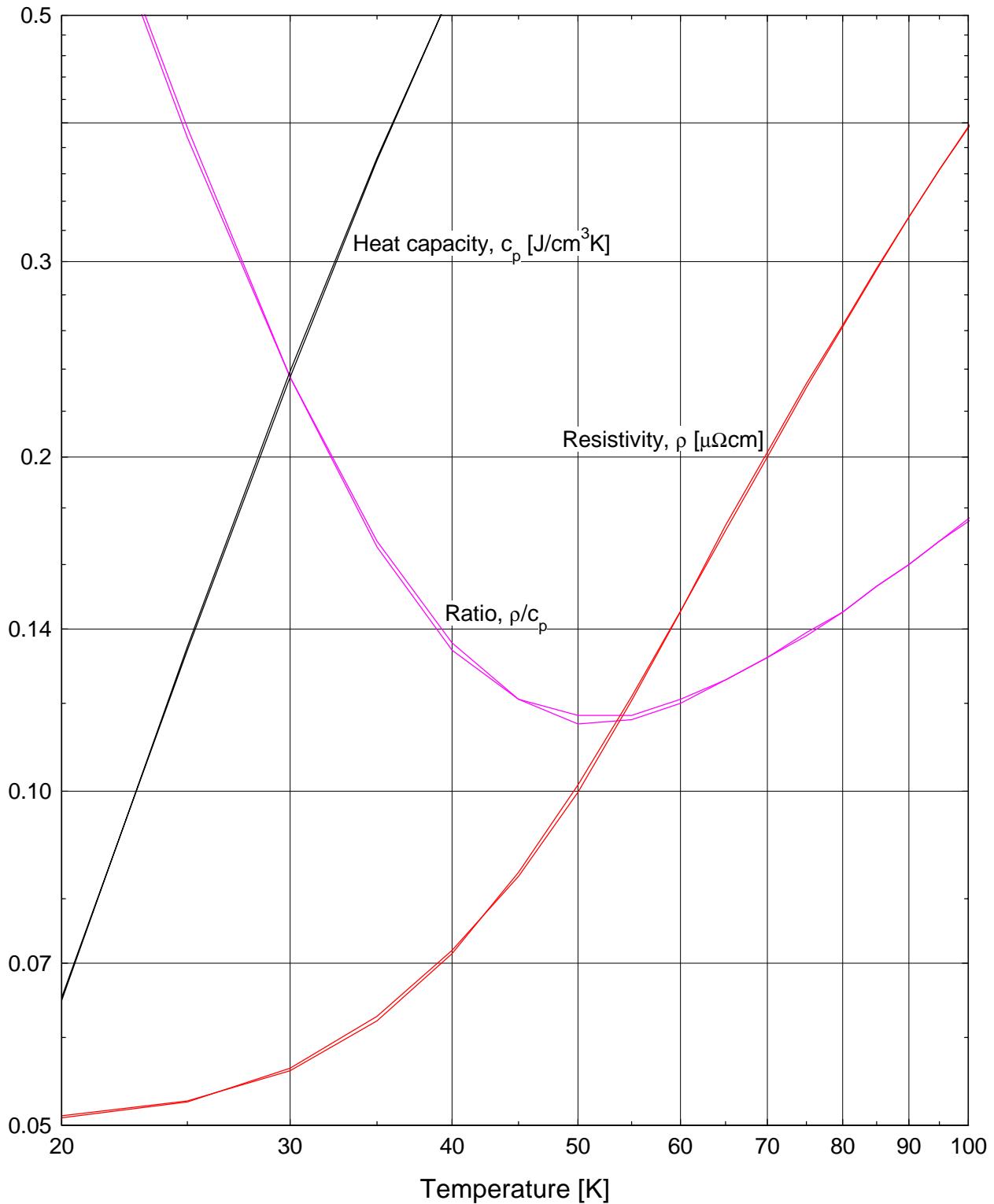
E951

15T Pulsed Solenoid



1. 2.2 MVA Pulsed Power Supply
2. 3.6 Metric Tonnes Coil Package
3. 30° K operation
4. Cost \$1.5M

ρ , c_p and ρ/c_p for High-Purity Copper at Very Low Temperature



E951 Pulsed Solenoid

Task Profile

